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This paper describes the creation of PortfolioSpace, a social digital portfolio creation system. It describes the original design and alpha release of the system, as well as its current beta release.

Headings:

Online social networks

Portfolios in education -- Computer-aided design.

Web sites -- Design

CREATION OF PORTFOLIOSPACE, A SOCIAL PORTFOLIO

by

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Approved by

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INTRODUCTION¹

A major problem facing the monolithic online social networks of today is that of context. Facebook combines multiple contexts. There is no difference between work friends or personal friends. Important information is lost when these relationships are taken out of context. My link to my wife is very different from the one to my boss, but that information is lost without context. In this paper, I propose and build an online social network named PortfolioSpace that plants relationships in a purely work-contextualized space.

PortfolioSpace began as two projects in the spring of 2008 at the School of Information and Library Science at UNC-Chapel Hill. The original proposal began as a project in Fred Stutzman's Social Networks course. The majority of PortfolioSpace's interface was designed in Professor Barbara Wildemuth's User Interface Design course.

SOCIAL NETWORKS AND SOCIAL CAPITAL

Online social networks reveal the hidden social network around us. In the real world, I can only see my immediate friends – people I know directly. My second tier of friends (friends of my friends) is mostly invisible to me. Most tiers beyond that are completely invisible to me. With online social networks, I can see all tiers of my social network and how those tiers connect to me.

Now that the social network is visible to me, I can capitalize on the social capital there. For instance, say I would like to work for a company, but I do not know anyone who works there. Using an online social network, though, I may see that a friend of a friend does work for that company. Now I have a link to the company – someone who can put in a good word for me or pass a resume along. I have used the social network for my own gain.

SOCIAL CONTEXT

These examples are easy to see in personal or job-related social networks because so much has been done to reveal these networks to us. Facebook, MySpace, LinkedIn, and Doostang allow us to easily track what friends and co-workers we have. However, none of these services put these relationships in the context of the actual work accomplished. There is no current way that I have found that creates a network via work done rather than social links. For example, in Facebook a social link can be described in many ways, such as “I attended school with this person,” or “We worked together.” These are tangentially related to work done, but are still primarily social links. There is no indication of what, if any, work happened.

Most online social networks also eschew hierarchy. All social links are equal. Again taking Facebook as an example, if I were to friend one of my professors, there is no way to say that that he is my professor. I can only say we are members of the same school. This does not really capture the true nature of the hierarchical link between us. The professor clearly has a social rank different than my own.

Work done and hierarchical links provide important context to social links. It is a very different thing to say “I am at the same school as Fred Stutzman,” rather than “I completed a project for Fred Stutzman as his student.” This link is very different from what typical online social networks reveal and has potential to provide different social capital.

PROPOSAL

To pursue this work-contextualized social network, I propose an online portfolio system. Users can create a portfolio of their work, providing the finished product itself, as well as descriptions of the work done. With each new element of the portfolio, links can be formed with others involved in the project. These links will be of two classes: partners and advisors. Partners are equal in standing and indicate co-workers on a portfolio element. Advisors are those higher in the hierarchy of work relations, such as professors or supervisors. The portfolio elements will appear in all linked portfolios with a designation of role. Once these links are present, the system will allow for traversal of those links. This system, entitled PortfolioSpace, is constructed at <http://apps.facebook.com/portfoliospace>.

DESIGN

ORIGINAL DESIGN

Much of the interface and functionality of PortfolioSpace was laid out in two earlier projects. A revised version of the task analysis is included here.

Task Analysis²

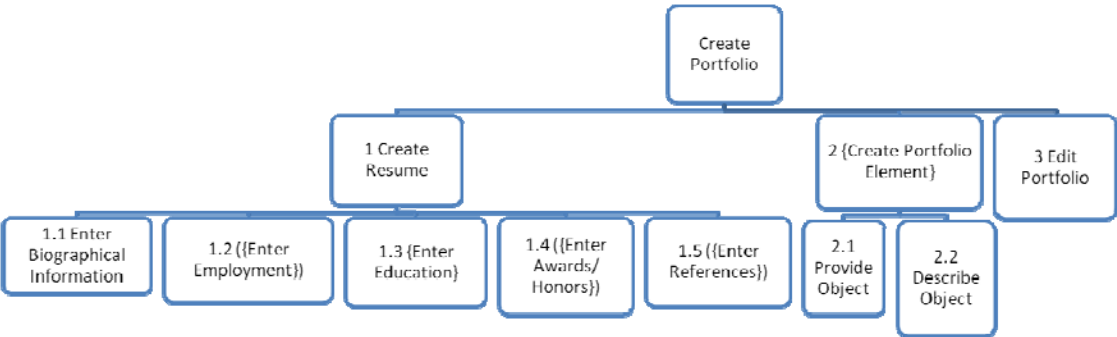


Figure 1 – Hierarchical Analysis

Essential Use Cases and Scenarios

1.1 Enter Biographical Information

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for biographical information
Provide name	
{(Provide address)}	
{(Provide phone number)}	
{(Provide email address)}	
{(Provide objective)}	
	Accept and store information

1.2 Enter Employment

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for employment information
Provide job title	
Provide employer	
Provide employer location	
Provide date of employment	
Provide job description	
	Accept and store information

Scenario

[Blaine is an Information Science graduate student. Preparing for job applications, he sits down at his own computer one weekend to prepare his portfolio.]

The system prompts Blaine for his most recent employment. He knows this off the top of his head and enters it quickly. He stalls on his job description, though. “What exactly do I do?” he wonders. “I do a lot of different stuff, but I need to condense it down to a few sentences. And I need to make my work sound interesting and challenging when I submit this to employers.” He hems and haws and finally turns out a job description. The system prompts him for his other employment. For the next several entries, he has to think hard about the employer details. He also hesitates on the job description for each entry. “An accurate job description is really hard to come up with on my own.”

1.3 Enter Education

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for education information
Provide degree title, including level of degree and major	
Provide university	
Provide date of graduation	
	Accept and store information

1.4 Enter Awards/Honors

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for awards/honors information
Provide award/honor title	
Provide presenter	
Provide date of award/honor	
	Accept and store information

1.6 Enter References

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for reference information
Provide name	
{{(Provide address)}}	
{{(Provide phone number)}}	
{{(Provide email address)}}	
	Accept and store information

Scenario 1

The system prompts Blaine for his references. He hesitates, as he hasn't officially asked anyone to be a reference. He stops what he's doing and sends off emails to possible references. He skips over references for now.

Scenario 2

The system prompts Blaine for his references. He has his references list handy from graduate school applications and enters the proper information.

2.1 Provide Object

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
	Prompt for object category – text, picture, presentation, sound, video, or hyperlink
Provide object category	
	Present suitable prompts according to object category
Provide object	
	Accept and store object as new portfolio element

Scenario 1

[Lindsay is a Music Education undergraduate student who is in her final year. As part of her school requirements, she must compile a digital portfolio of her work. The school has already decided what entries must be included and has provided this portfolio system to complete the task. Lindsay's seminar class has chosen today to go to the campus computer lab to start their portfolio creation. The professor moves around the room to assist. People are chatting, typing, and complaining about the portfolio. The

environment becomes fairly noisy and uncomfortable for Lindsay, as she enjoys working in a quiet space.]

Lindsay is prompted for her first portfolio element. She references her portfolio directions and decides to begin with her research papers. She selects Research Paper from the category list. The system prompts her for the paper's file. She digs around in her bag and produces a flash drive with her papers on it. She plugs it into the computer, browses for the correct file and chooses it.

Scenario 2

Lindsay is prompted for her first portfolio element. She references her portfolio directions and decides to begin with her research papers. She selects Research Paper from the category list. The system prompts her for the paper's file. She digs around in her bag and produces a flash drive with her papers on it. She plugs it into the computer, browses for the correct file, but can't find it. It must be on her computer at home. She wants to move on but worries she'll forget about this research paper later. She makes a note on her portfolio directions to go back and include the research paper she is missing.

2.2 Describe Object

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
Select object	
	Prompt for description of object
Provide title of object	
(Provide purpose of object)	
Provide description of object	
{{Provide names of other people who worked on this object}}	
{{Provide names of advisors or professors for this object}}	
	Accept and store information

Scenario

The system prompts Lindsay to describe her research paper. She opens the file, copies the title, and enters it in the space. She can't remember the purpose of the paper, though. The assignment was long ago and fairly open-ended. She skips over it. In order to describe the paper, she skims over the first few pages to remind herself of it. She copies some text from the introduction and conclusion paragraph and pastes it in the description box. Since she has the paper open, she copies the names of her partner and her professor into the appropriate fields.

4 Edit Portfolio

Essential Use Case

USER INTENT	SYSTEM RESPONSIBILITY
{{Navigate to desired area	
Make changes according to area	
Accept and store information}}	

Scenario

After finishing arranging this portfolio, Blaine begins to rethink some things as he reads over them. He goes back to the resume section and edits his job descriptions. He goes back to his elements and makes some description changes there as well.

CHANGES TO ORIGINAL DESIGN

The original design and functionality emphasized the creation of the portfolio itself. The idea was that this was a portfolio creation system with social elements attached. As my thinking progressed, the portfolio creation became more mundane and the power of the social network being created became more and more important. The original design talked much of how users will create portfolios and why. The current system is less focused on simple portfolio creation and much more tied to the social network aspect of the system. For example, the “Arrange Portfolio” task has been completely dropped. All user portfolios will look the same with no option for arranging, not or there any pressing desire to do so. The portfolio display is still dominated by portfolio element description and resume information, but several key elements have been added, most importantly the partners, advisors, and advisees boxes. These boxes list anyone the portfolio owner has

worked with or for. This allows for a quick reference to network links without looking through portfolio elements first.

The original task analysis and interface design did not address the issue of privacy at all. A new task of privacy settings was added. These settings affect who can see what parts of the user's portfolio. This task has its own page, mirroring the rest of the overall design.

One key element of the user interface was significantly changed. The Portfolio Elements tab was initially designed like the Resume tab where all functionality occurred on one page. This means that the resume data is created, edited, and deleted by the user on one page. This did not work for the portfolio element tab; there was simply too much on one page. The tab was broken into three pages: view all portfolio elements, create a portfolio element, and edit a portfolio element. This allowed for the user to focus on one task at a time, rather than being inundated with many different options at once. By hiding functionality that is not needed, I was able to tie this tab back into the overall design philosophy of the system.

Creation

PortfolioSpace has gestated for over a year at this point. I first proposed the system in spring 2008 and began user interface design after that. Within a month, a non-working prototype was finished and evaluated. After another month, the prototype had basic functionality. As part of the user interface design, an initial draft for a formal usability study was drawn up. The prototype was presented as proof of concept in April 2008.

Work was frozen after this to pursue other, more pressing projects, and work resumed in January 2009.

Timeline

- February 2008
 - Original system proposal
 - User Analysis
 - Task Analysis
- March 2008
 - Initial interface design
 - Interface prototype completed
 - Begin function coding
- April 2008
 - First prototype presentation and feedback
 - Alpha Release
 - Plans for usability testing drawn up
- January 2009
 - Project schedule created
 - Old code brought up to date
 - Privacy policy written
- February 2009
 - Primary development phase
- March 2009
 - Beta Release

Alpha Release

PortfolioSpace entered Alpha in April 2008. Functionally, this period was really a proof of concept. Users could add and remove portfolio elements and link those elements to a single partner and a single advisor. Elements could not be edited. File upload worked, but was not very robust. No privacy controls had been built. However, a mock network of users and elements could be set up and demonstrated.

In addition, the majority of the user interface had already been designed. The application was divided into task-oriented sections. By breaking the overall task into chunks of

subtasks, the user could easily navigate through the system while only focusing on one task at a time. The resume tab, where users enter personal, employment, and education information, was mostly complete and would not change greatly through the rest of development. Since this tab was such a success, judging by informal user polling, the Portfolio Elements tab was initially modeled after it. This proved unwieldy and was changed during the beta release.

Beta Release

PortfolioSpace re-entered development in 2009. Changes in the Facebook platform necessitated updating the old code to bring it up to date. Once the Alpha release was functional again, preparatory work for the Beta release began.

Privacy Policy

Of utmost importance was that a suitable privacy policy be created. I consulted the TRUSTe website, a leading provider of privacy seals and resolver of privacy disputes. Their document *Your Online Privacy Policy* was instrumental in creating the current privacy policy. I wanted to emphasize their points about a privacy-policy being consumer-friendly. According to TRUSTe, such a policy is:

- Accessible
- Easy to understand
- Neither too short nor too long
- Prioritized
- Updated as needed

PortfolioSpace's privacy policy is short and to the point. Technically, this is not a full privacy policy - there should be a more fully-described privacy policy to back this up in

case of legal trouble. However, with this beta release being so limited, I felt it could wait until a later release date. For now, this policy covers enough to inform the user without being so long that it would remain unread. The privacy policy is linked at the bottom of all system pages and shown here.

We collect:

- Personal information such as your name, email address and phone number when you register to use PortfolioSpace.
- Resume information such as your employment and education history when you provide us with that information.
- Portfolio information such as work you've done and those you've worked with when you add them to your portfolio or those you have worked with do so.
- Anonymous information such as your IP address, browser name and version, and pages you have accessed. This information is not tied to any personally identifiable information.

We use this information to:

- Maintain your account with us
- Communicate with you
- Enable you to share this info with others at your discretion.
- Evaluate our services by maintaining traffic and performance logs and generating reports of use. All information in these reports is anonymous and will never contain any personally identifiable information.

We will never sell, rent, or share your information with any third party you haven't approved except where required by law.

Your choices:

- You can select who to share your information, resume, and portfolio with. By default, all sharing is turned off until you enable it.
- You can control what messages we can send you.
- You can tell us to delete your information at any time. We will not retain this information once deleted except in periodic backups. Because our backups are automated, your information will not be fully purged from our systems until backups cycle again. We pledge not to retrieve deleted information from these backups.

Terms of Service

PortfolioSpace is offered as-is. As this is an academic effort in constant flux, no guarantees are made by the developer. If you have questions or other concerns about these policies, please send an email to portfoliospace@headovertarheels.com at any time.

Development

Since much of the interface was already completed, the next focus was on filling missing functionality. The following feature list was created, organized by priority:

- I. Essential
 1. Allow more than one advisor or partner
 2. Privacy settings

3. Link verification (subject to privacy policy)
4. Allow for non-friends to be linked
5. Allow for easy user feedback at any time

II. Important

1. Edit portfolio elements
2. Link to hosted work
3. Option to not upload work
4. Elements still have "owner" - partner link should be equilateral
5. Ability to add work you advised
6. Search

III. Optional

1. Tagging
2. Allow for viewing outside of Facebook
3. Optimize for speed

Development lasted from January to March. Most features were successfully implemented, but, as in any project, some features were left by the wayside. In the end, link verification, the ability to add work the user advised, and the optional features were left unimplemented. Link verification is still important to the system as it grows, but not essential at these early stages. Its initial ranking of "essential" was ill-advised. Link verification is an issue of trust within a large system. Within a small beta release such as this, this is not as important as getting the rest of the system off the ground.

Results

PortfolioSpace launched in March 2009 and is located at <http://apps.facebook.com/portfoliospace>.

Screenshots

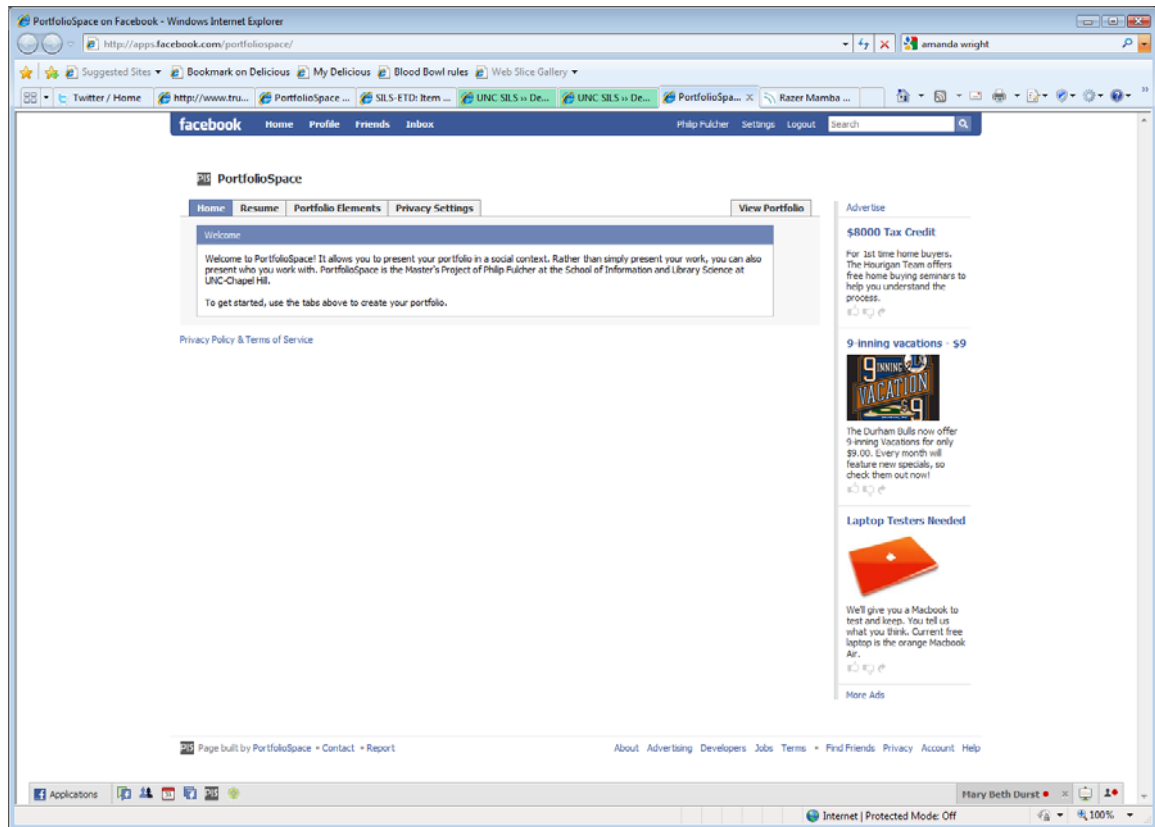


Figure 2. Index page

This is the first page users see after registering for the system and accepting the terms of service. It displays the overall layout of the system. Tabs at the top of the page separate tasks into separate pages. A link to the privacy policy and terms of service is at the bottom. The text here directs the user to the above tabs to begin their portfolio creation.

The screenshot shows a web browser window titled "PortfolioSpace on Facebook - Windows Internet Explorer". The address bar shows "http://apps.facebook.com/portfolio-space/resume.php". The browser has several tabs open, including "PortfolioSpace ...", "UNC SILS ...", and "Razer Mamba ...". The Facebook navigation bar is visible at the top, with the user's name "Philip Fulcher" and links for "Home", "Profile", "Friends", "Inbox", "Settings", and "Logout".

The main content area is titled "PortfolioSpace" and has tabs for "Home", "Resume", "Portfolio Elements", and "Privacy Settings". The "Resume" tab is active. At the top of the resume section, there are buttons for "Unsaved" and "Save".

The resume is divided into two main sections: "About Me" and "Employment".

About Me Section:

- Name: Philip Fulcher
- Address: 814 Patriot's Pointe Drive, Hillsborough, NC 27278
- Phone: 919-300-0214
- Email: pf1uc@email.unc.edu
- Objectives: To enhance my own understanding of information systems while gaining real world experience with an emphasis on

Employment Section:

There are two job entries, each with a "delete" button (X) in the upper right corner.

Job 1:

- Job Title: Lab Manager
- Employer: School of Information and Library Science at UNC-Chapel Hill
- Location: Chapel Hill, NC
- Dates: August 2007-Present
- Description: Technical position of various facets including Technical Writing, IT lab solutions (hardware, software, and

Job 2:

- Job Title: CA Labs Intern
- Employer: CA, Inc.
- Location: Cary, NC

On the right side of the page, there are advertisements for "Arrested Development Tees", "Get a Green Computer Now" (IntelliGreen), and "Refer a Great Stylist" (Sport Clips).

Figure 3. Resume page

The resume page uses Ajax to allow the user to add information to their resume without loading a page. The page is divided into sections for different resume elements: contact information, employment, education, awards, and references. Each section has an “add” button at the bottom, allowing the user to add another information element to each section. For example, the user would click the “add” button below the employment section each time he or she wanted to add another job to your employment history. Each element then has a “delete” button in the upper right-hand corner.

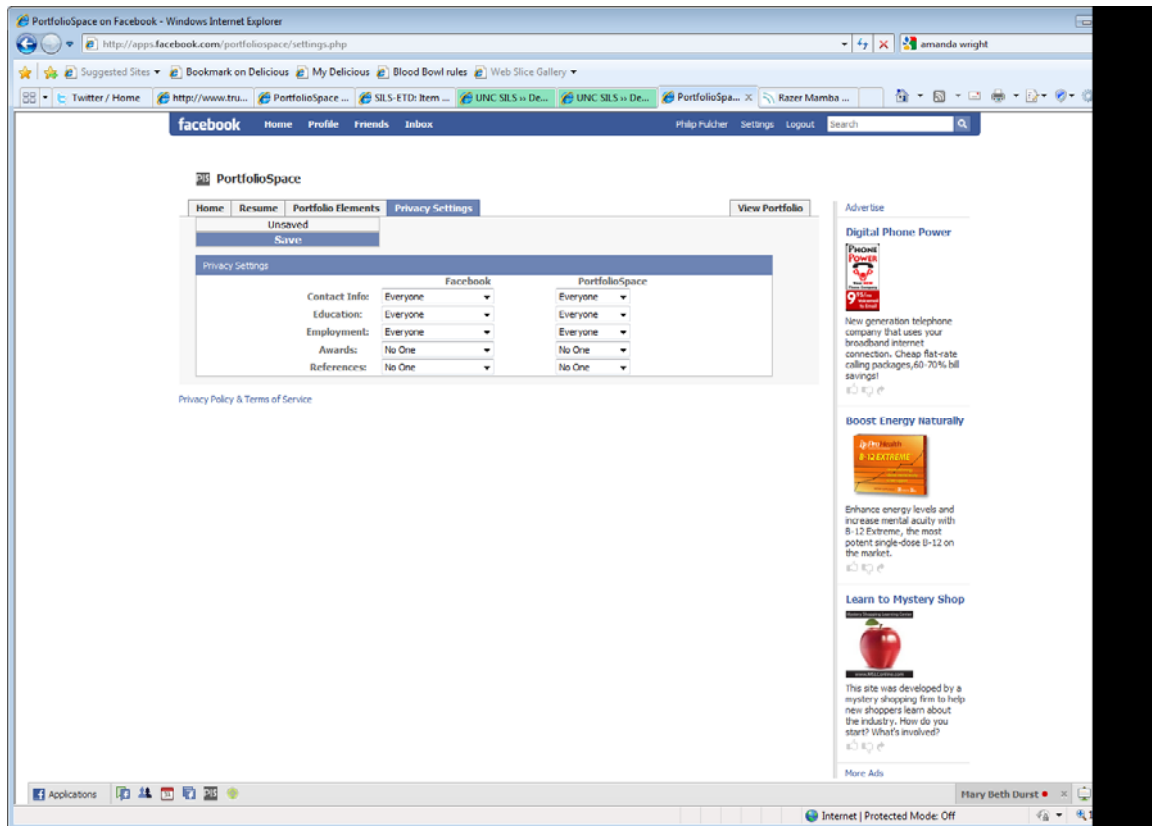


Figure 4. Privacy Settings page

The privacy settings page allows the user to reveal elements of their resume to other users. Because PortfolioSpace exists within Facebook, the user can allow different permissions to those who are part of PortfolioSpace or those who are only part of Facebook. The default is to hide resume information from everyone. In this way, the user must enable sharing before their information is given to anyone else.

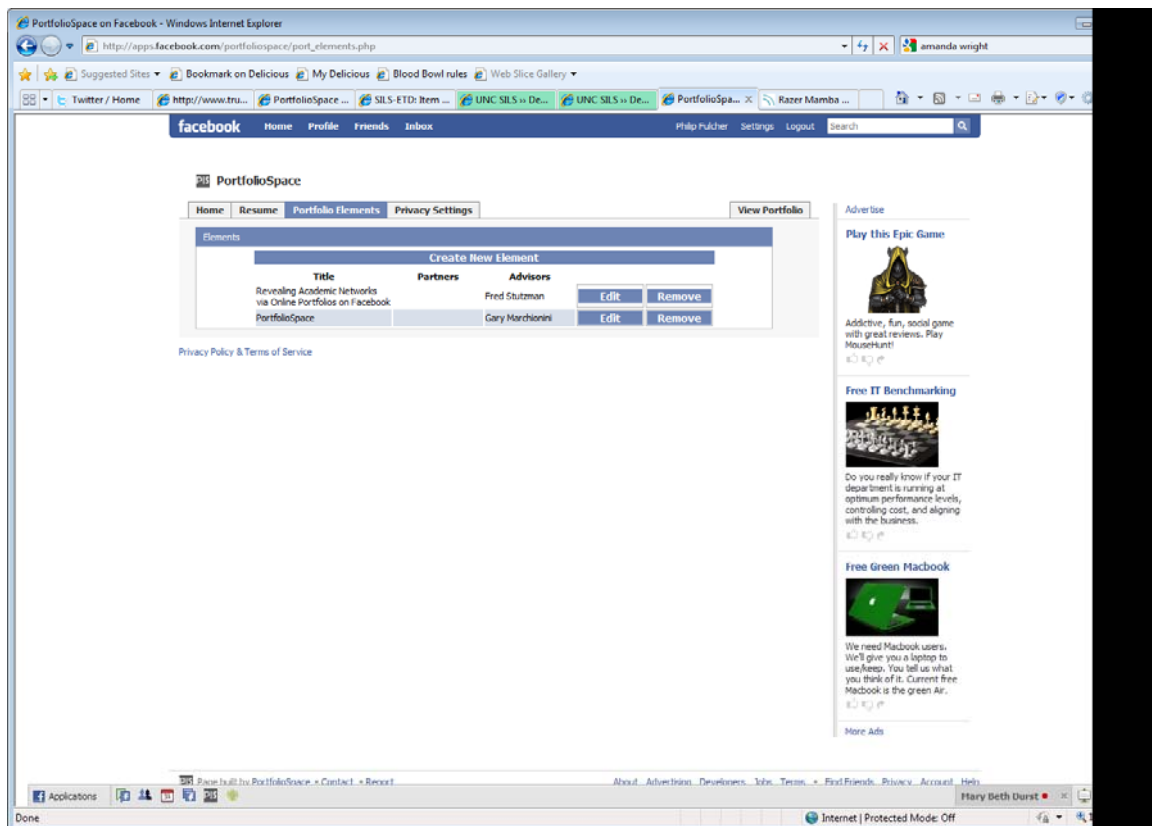


Figure 5. View Portfolio Elements page

The View Portfolio Elements page gives the user a place to manage the elements of their portfolio. They may add, edit, and delete elements from this page. Again, Ajax is used to avoid page loads.

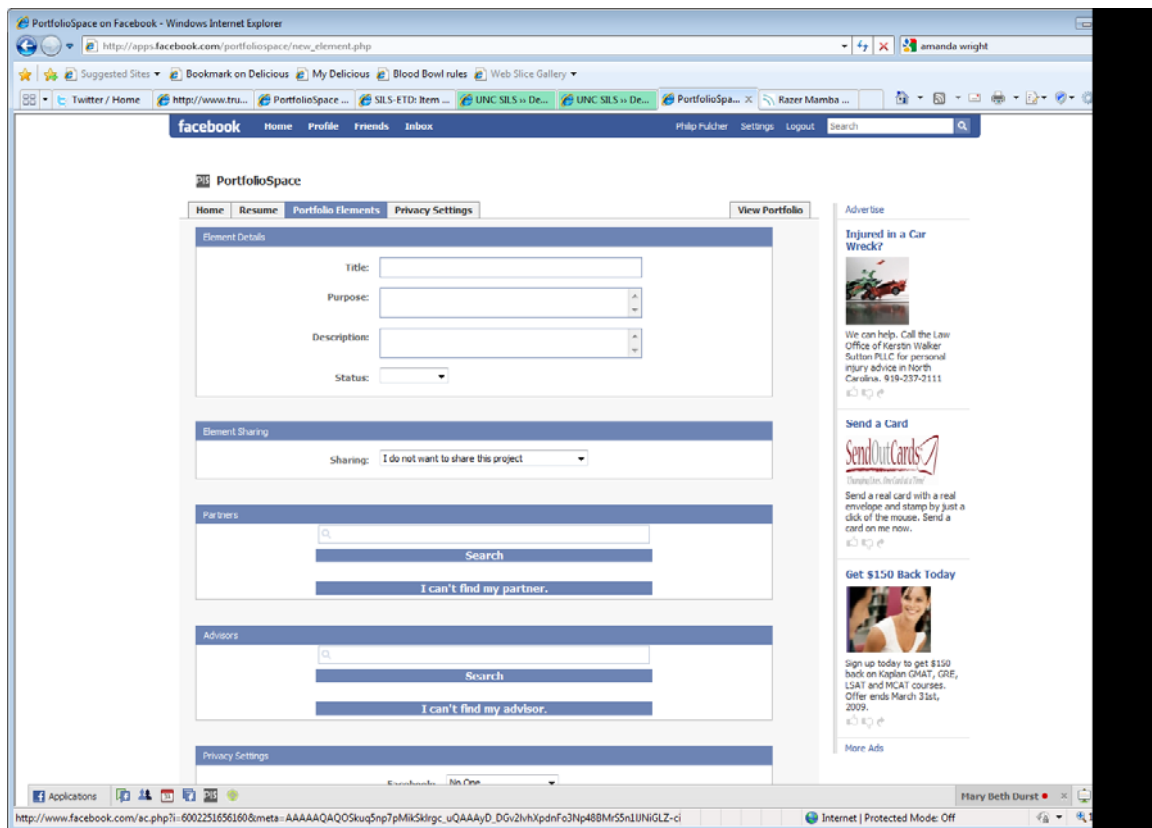


Figure 6. Create/Edit Element page

This page allows the user to create a new element. The first section allows the user to describe the element and its purpose. The “Sharing” section allows the user to either link to a web page where the project is posted or upload the project to PortfolioSpace. The “Partners” and “Advisors” section have an Ajax search function that searches for both current PortfolioSpace users and Facebook users. Each result has a link to that person’s Facebook profile or PortfolioSpace portfolio to confirm their identity. If the partner or advisor does not exist in either system, an “I can’t find my partner” option is at the bottom of the section. This allows the user to enter the partner or advisor’s name and email address. The last section allows the user to set the privacy for this element,

mirroring the options on the Resume Privacy Settings page. The Edit Element page is a mirror of the create element page, it simply updates records instead of creating them.



Figure 7. View Portfolio page

The View Portfolio page is where user information is displayed and the social network is exposed. Along the left is the user's resume information and links to everyone he or she has worked with. Each name has a link to that user's portfolio. The right part of the page lists the user's work in two sections: My Work and Work I Have Advised. The title of each project is a link to display that project. The partners and advisors of each project are listed below the project information.

Successes and Difficulties

Most essential functionality is implemented. The system has ten registered users with links to four unregistered users. Seven portfolio elements have been created and shared. Unfortunately, it is hard to pull any real conclusions from this data. From informal user polling, there have been some bugs and issues, but the system on a whole has been praised.

PortfolioSpace makes intelligent use of Ajax. In other projects, I have over-used Ajax to the point of absurdity. One previous project never had a page load; everything was loaded and done via JavaScript. PortfolioSpace uses Ajax to avoid page loads when necessary. For example, on the resume page, users can add new jobs or degrees without having to reload the page. Everything for the resume task happens on that one page. Rather than just making things prettier, the Ajax used here enhances the usability of the site by limiting the task to one page and area of focus, rather than spreading it across several pages.

Furthermore, Ajax works around some of the speed issues of the Facebook platform. the Facebook platform as a whole is rather slow because of its structure. When a user requests a page, the Facebook requests the page from PortfolioSpace. Facebook processes the page and finally displays it. This results in a lot of transit time and multiple processes for a single page load. By eliminating page loads when possible, the speed of the system is improved, providing a better user experience.

With any system of considerable size, problems are going to arise. Many difficulties lay in the complex operation between Facebook JavaScript (Facebook's JavaScript

framework) and PHP. With so many operations happening in different places, it quickly became obvious that an error reporting system would be necessary for the project. A table was added to the database to store the error reports. Each operation had an error state defined and description created. A small PHP script would display these errors in HTML in an admin section. This slowed development, but made troubleshooting much easier and will aid in future development.

The inherent difficulties of developing for the Facebook Platform have to be addressed. Facebook Markup Language (FBML), Facebook JavaScript (FBJS), and Facebook Query Language (FQL) cause more problems than they solve. FBML allows for consistent styling, but is inflexible. If you want to keep the styling, but do something slightly different, you're left grabbing styles from their CSS and building your own tables, trying to copy what they've accomplished. FBJS prohibits many of the standard JavaScript functions and replaces them with new ones. Development time is spent re-learning how to do things that were previously easy. FQL prohibits table joins, so any operation involving more than one table requires at least two queries and often more.

Developing the system alone was also a trial. Because I worked alone, I had only one perspective of the system. I should have been more active in seeking an outside perspective to aid my own. When I ran into problems, I often barreled ahead with one solution, only to find it did not work and I had to begin anew. After observing some users with the system, it was clear that were attempting to use the system in ways I had not considered. One user, a music director, wanted to display her latest concert with her students. The idea that a portfolio element could be linked to dozens of people was not something that I had considered. While I believe that the database queries and data

operations could handle such a thing, the actual portfolio display could not display that many partners appropriately.

Despite the difficulty of working alone, I was able to effectively manage the project. Before work began, objectives and a time line were set up and work proceeded along that path. The work thus followed a long a pre-determined path that allows for greater predictability of time and work in the project.

Future Work

Obvious future work includes going back to my planned list of functions and including all of them. Once this is done, there are already plans drawn up for a usability evaluation. The testing is iterative and modeled after Slaven, Paterson, and Ewers' work in *Why One is Never Enough: A Case Study of Iterative Testing of a Library's Online Services* (Slaven, Paterson, & Ewers). The system is finally at a stage where usability testing could show real results. Before this, the system simply was not complete enough to give to users for testing. Iterative testing would work out the kinks and bugs left in the system as well as find good feedback from users about the overall system.

Beyond functionality and usability lies the ultimate question: is this a useful product? This will only become apparent as more people use the system and build networks.

Conclusion

PortfolioSpace represents months of preparation and development. This paper can only provide a snapshot of the work put into the system. I learned a great deal throughout its

development in many areas: systems analysis, user interface design, database design, web development, project management, and social networking. With the system finally released to beta, real study of a work-contextualized social network such as this can begin. Regardless of theoretical benefits, a social network is useless without a population. I hope that a population finds PortfolioSpace, and it realizes its potential. Going forward, the success of this system is much less dependent on me, and much more dependent on its users.

Notes

- 1 Excerpted from *The Power of Context in Online Social Networks*.
- 2 Excerpted from *PortfolioSpace Design Documentation*.

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